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(56) Documents Cited:
EP 1364173 A EP 1106938 A
EP 0857926 A US 6670541 A

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Other: ONLINE DATABASES : WPI EPODOC JAPIO

(54) Abstract Title: **A mounting for a solar panel**

(57) A mounting for solar panels has fixings which enable it to be easily attached to other mountings to form a solar array. The mounting has a frame (1) with a recess (9, Fig.3b) into which a solar panel (5) fits. The frame has a front edge flange (2) and an open rear edge (8). The front edge A is narrower than the rear edge B, enabling the front edge of one frame to fit beneath and inside the rear edge of another frame. The frame includes holes for rivets and screws (6)(7, Fig.1b) allowing the respective frames to be fixed together. The frame includes side interlocking means (4a)(4b, Fig.1b) so that a plurality of frames can be attached to each other in a side-by-side arrangement. The frame slopes upwardly from the front to the back of the frame. The solar module (5) fits into the recess so the top of the panel is flush with the top of the recess. The mounting can be made of recycled plastics by vacuum forming.

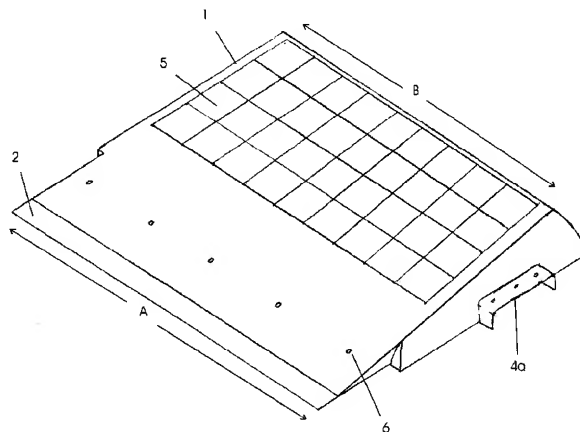
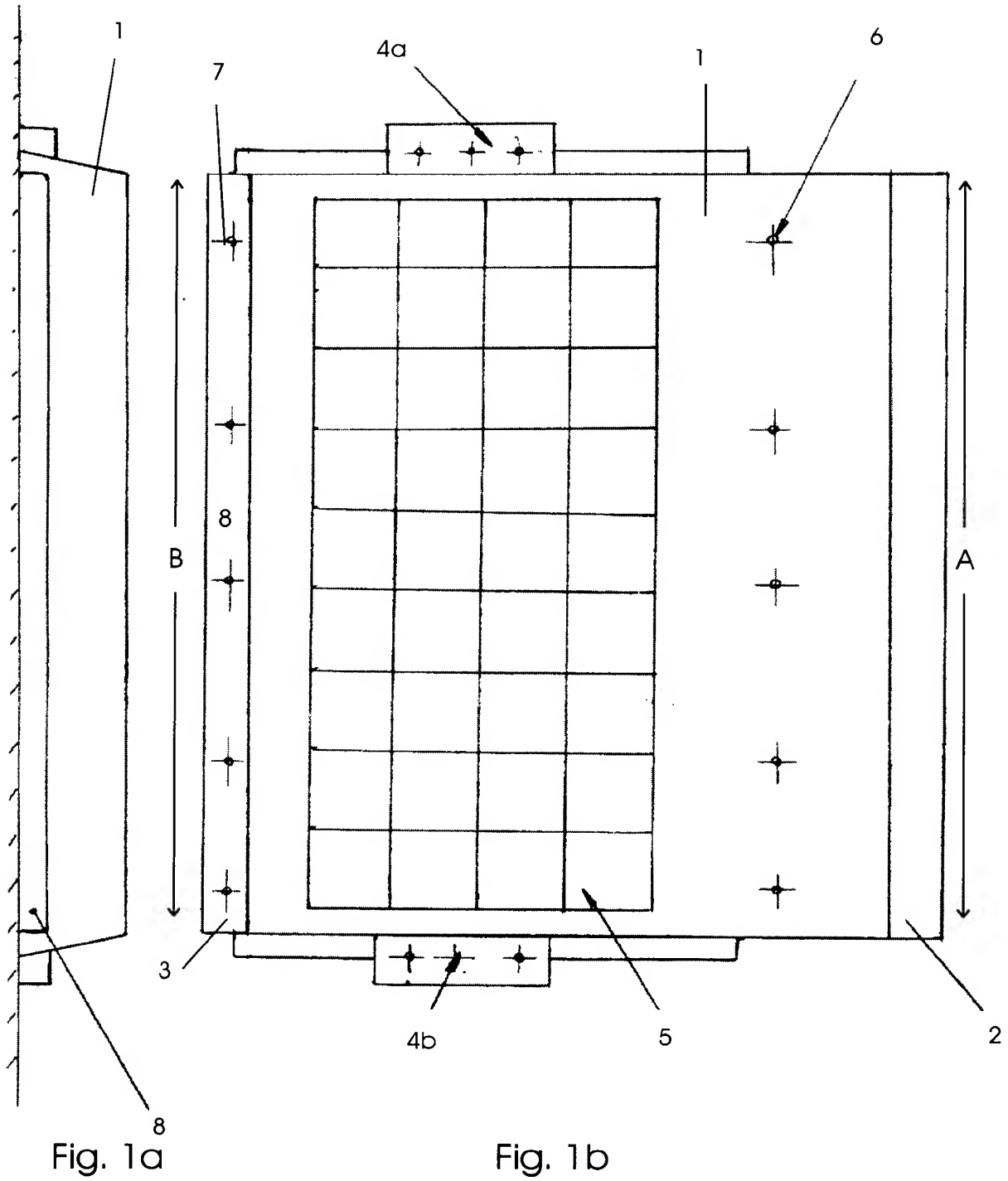


Fig. 2

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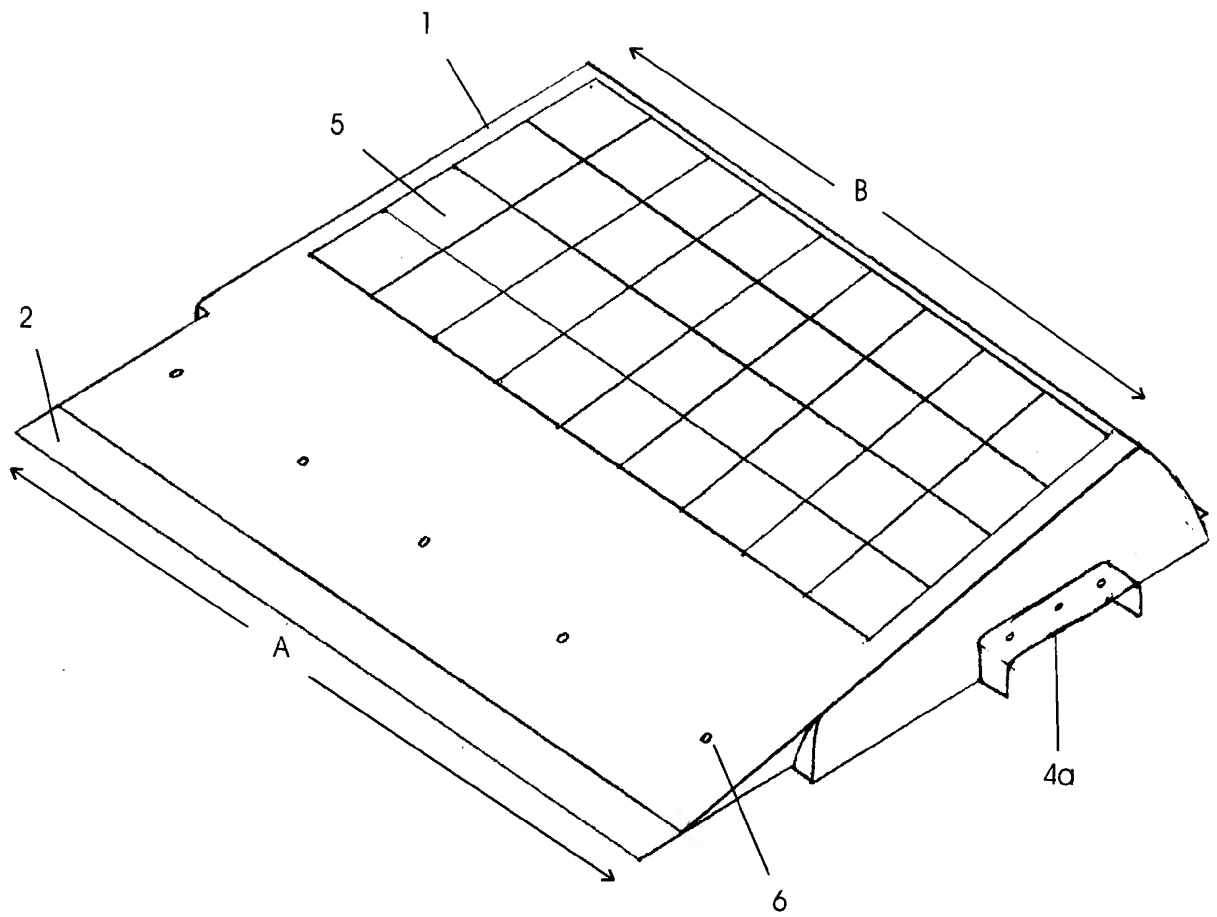


Fig. 2

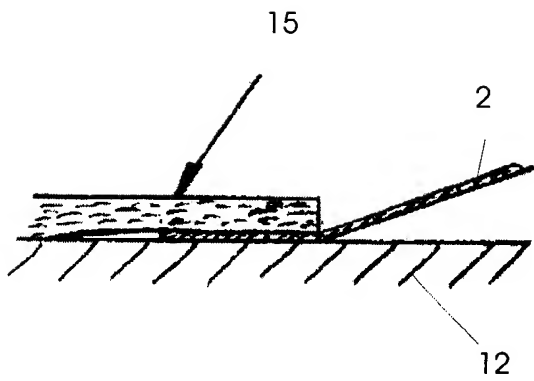


Fig. 3a

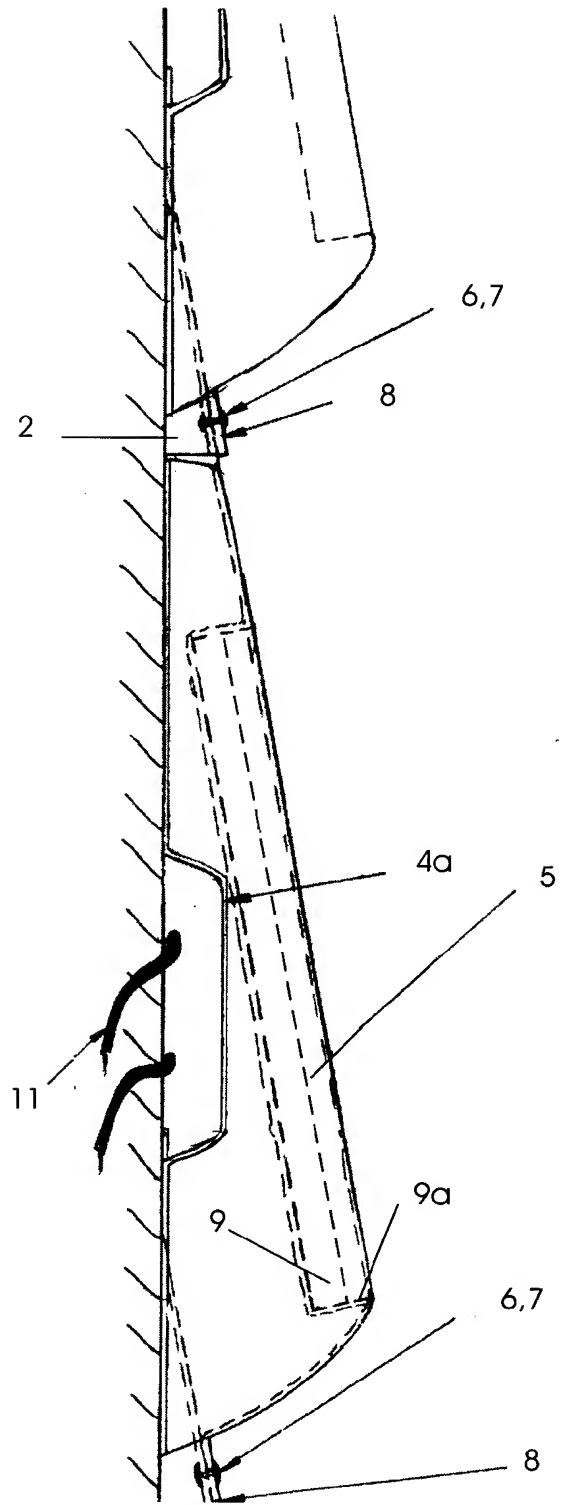


Fig. 3b

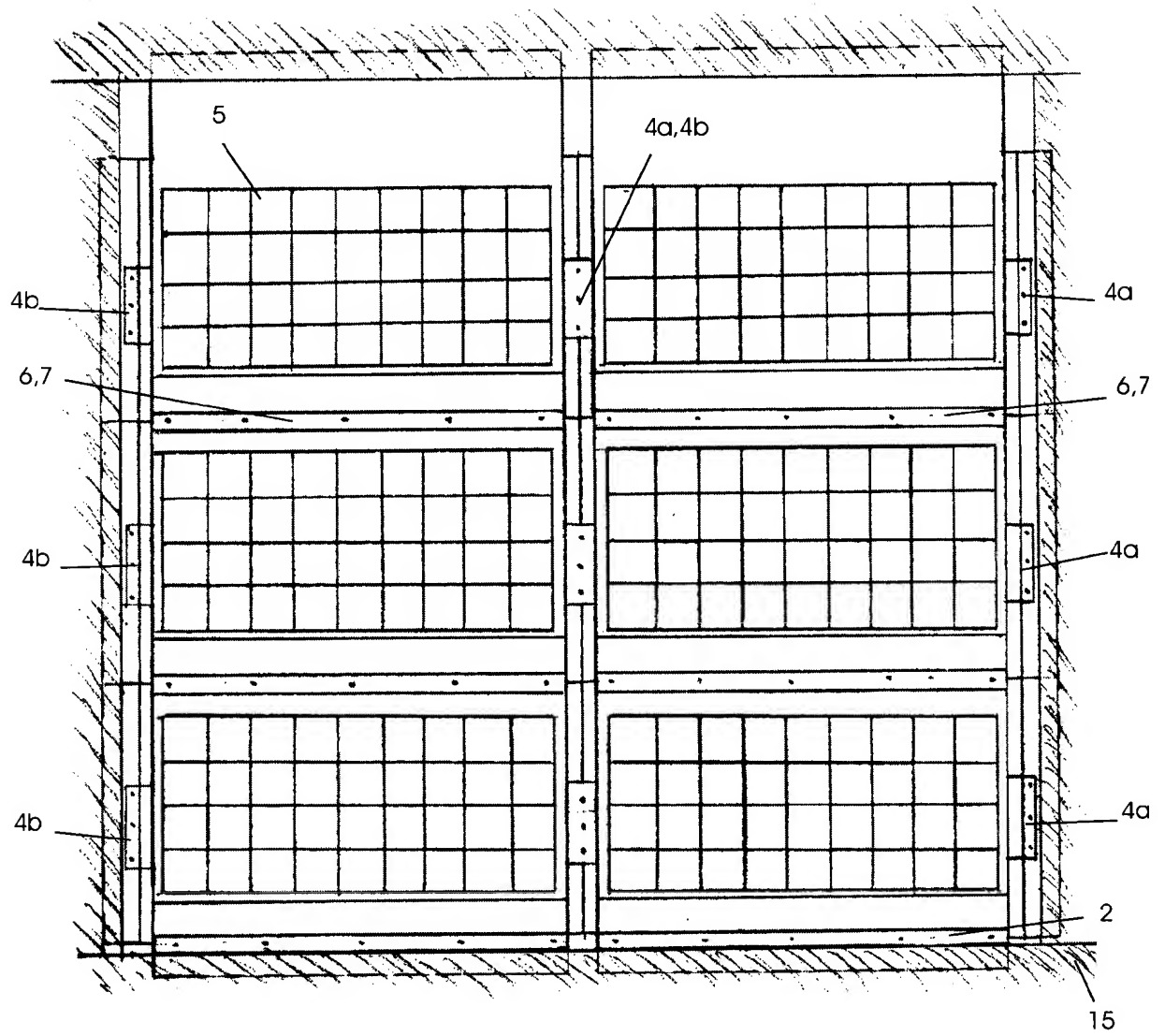


Fig. 4

Mounting

The present invention relates to a mounting for solar panels which can be used on roofs etc.

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Building Integrated Photovoltaics (BIPV) is a rapidly growing industry worldwide (about 25% growth annually). BIPV involves solar modules mounted on buildings and the DC electricity generated fed to the national grid through DC/AC inverters.

10 Many existing systems require structural changes to the roof or penetration of the roof which can lead to leaks and can be difficult to install involving building work.

We have now devised a modular mounting for solar panels which overcomes these difficulties and which by assembling modules together can be form an integrated
15 solar array of any size.

According to the invention there is provided a mounting for solar panels which mounting comprises a frame having a recess for receiving solar panels, the frame having a front edge and a rear edge in which the front edge is narrower than the rear
20 edge and the front edge of one frame is adapted to fit beneath and inside the rear edge of another frame and to be attached to the said other frame, the frame having side fixing means so that a plurality of frames can be attached to each other in a side-by-side arrangement and the frame sloping upwards from the front to the back.

25 Front, back, side and top refer to the frame when the frame is laid on a flat surface with the recess uppermost.

In use a solar panel or solar panels are placed in the recess in the frame so that sunlight can impinge on the solar panels. To cover a larger area a plurality of frames
30 are connected together with the front edge of one frame fitting within and connected

to the rear edge of another frame and/or frames being connected side by side. In this way any size of area can be covered with solar panels.

5 Preferably the frame is made by vacuum forming of a plastics material e.g. a recycled plastic.

The angle of slope of the mounting is preferably 5 to 20 degrees e.g. about 10 degrees and can be achieved by having a wedge shaped side piece attached to each side or under the mounting so the mounting has a wedge shape.

10 The recess in the top of the mounting preferably is of a size to allow a standard solar panel module to fit into the recess and preferably the top of the solar module is flush with the top surface of the mounting.

15 Preferably there is space in the recess to accommodate the solar panel junction box on the underneath of the solar module containing solar panels, with holes for wiring from the junction box to inside the mounting.

20 The solar panel module can be fixed to the mounting with either rivets or self-tapping screws through the underside of the mounting

The back of the mounting preferably has an opening and a lip so that the front thinner end thin end of another mounting can be inserted into the opening and fixed in place e.g. by riveting or screwing in place.

25 This can be done with a number of mountings so that a row of interlocked mountings can be assembled. The design and size of the ends preferably minimises the shading effect of the back end on the solar panel in the next mounting module in the line.

The side fixing means of each frame enables the mountings to be attached to each other, these fixing means can be of a conventional type e.g. with the attachment means on one side being smaller than on the other side allowing them to be interlocked with the fixing means on adjacent mountings. Preferably the fixing means are hollow so that the cables etc. from the solar modules can be fed into each mounting without being seen and out of touch.

The mountings can be attached to each other by any fixing means e.g. by riveting or screwing to each other.

10

By attaching mountings to each other in columns and rows a completely interlocked solar array can be assembled of any size and there could be many hundreds of interlocked mountings making a complete installation.

15 In order to allow more secure fixing the front end of the wedge shaped mounting preferably has a flange to allow a covering to be overlapped with the flange so that the front of the flange is firmly held to a surface. This gives final security in case of high winds and 'traps' the interlocked array.

20 In an array preferably the outer mountings of the assembled interlocked array have additional 'caps' riveted or screwed through the sides and back thick wedge end to cover the holes and provide a flange for the floor covering to overlap ensuring the array is 'trapped' on all sides, thus minimising possible lift of the array due to high winds.

25

In use the wires from each solar module in a mounting can be connected to other solar modules to enable the electricity generated to be led a way. The connections can be in parallel and/or series to produce the optimum current and voltage.

It is a feature of the mounting of the present invention that flush modules in the mounting give an integrated appearance, it is easy to install so eliminating time spent on building work, it is low cost and is fast to install without highly skilled labour, reducing labour cost and is easy to disassemble so repairs and roof maintenance can
5 be carried out. When assembled the interlocking of the mounting ensures the complete solar array is one assembled 'block' and edge covering and interlocking ensures safety in high winds.

The mounting can easily be made from recycled plastics materials e.g. by vacuum
10 forming.

As well as being mounted on roofs an array can easily be mounted anywhere and is specifically designed for use with flat roofs; the modular arrangement enables shapes other than rectangular to be more nearly filled with solar panels.

15 For the Northern hemisphere the mounting will be orientated towards the south to maximize energy collection.

The invention is illustrated in the drawings in which: -
20

Fig. 1a shows a rear view of a mounting

Fig. 1 b shows a plan view

Fig. 2 shows a schematic view

Fig. 3a shows the front fixing to surface

25 Fig, 3b shows a side view

Fig. 4 shows a plan view of an assembled array

Referring to the drawings a mounting has a frame (1) with a recess into which a solar panel array (5) fits. The mounting has a front edge flange (2) and a rear edge (8). The
30 distance A is less than the distance B and there are fixing holes for rivets or screws at

- (6) and (7) and side interlocking fixings (4a) and (4b). As can be seen in fig. 1a the rear edge (8) is in the form of an opening so that the front flange (2) of another mounting can fit into the opening and the mountings held together by rivets or screws passing through (6) and (7). This is shown more clearly in fig. 3b in which the solar module (5) fits into the recess (9) so the top of the panel is flush with the top of the recess. The cables (11) pass out through side fixing (4a). In fig. 3a the front flange (2) is positioned under a mat (15) which is attached to a roof surface (12) to hold the front flange (2) firmly in place.
- 10 To assemble the array shown in fig. 4 a number of modules are interlocked with the front edge flange of one mounting fitting into the rear opening of another mounting as shown in detail in fig. 3b. The side fixings (4a) and (4b) are interconnected to lock the mountings together to form a continuous interlocked module. The cables of the solar panels are connected together in the appropriate way and the whole array
- 15 assembled for use.

Claims

1. A mounting for solar panels which mounting comprises a frame having a recess for receiving at least one solar panel, the frame having a front edge and a rear edge in which the front edge is narrower than the rear edge and the front edge of one frame is adapted to fit beneath and inside the rear edge of another frame and to be attached to the said other frame, the frame having side fixing means so that a plurality of frames can be attached to each other in a side-by-side arrangement and the frame sloping upwards from the front to the back.
2. A mounting as claimed in claim 1 in which the frame is made by vacuum forming of a plastics material.
3. A mounting as claimed in claim 1 or 2 in which the angle of slope of the mounting is 5 to 20 degrees.
4. A mounting as claimed in claim 1 or 2 in which the angle of slope of the mounting about 10 degrees.
5. A mounting as claimed in any one of the preceding claims in which the recess in the top of the mounting is of a size to allow a standard solar panel module to fit into the recess with the top of the solar module flush with the top surface of the mounting.
6. A mounting as claimed in any one of the preceding claims in which there is space in the recess to accommodate the solar panel junction box on the underneath of the solar panel.
7. A mounting as claimed in any one of the preceding claims in which the back of the mounting has an opening and a lip so that the front end of another mounting can be inserted into the opening and fixed in place

8. A mounting as claimed in any one of the preceding claims in which the front end of the frame has a flange to allow a covering to be overlapped with the flange so that the front of the flange is firmly held to a surface.

5

9. A solar array comprising a plurality of mountings as claimed in any one of the preceding claims containing solar panels in which mountings are connected together.



INVESTOR IN PEOPLE

Application No: GB 0301280.4
Claims searched: All

Examiner: M C Monk
Date of search: 9 February 2004

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance	
A		EP 1106938	BRINIC Solar panel held in a supporting device.
A		EP 0857926	COOEPRATIEF ADVIES EN ONDERZO Supporting device (1).
A		EP 1364173	URBINK NEDERLAND BV; VAN SCHELLEBEEK DIRIC JOHANNES Tray shaped carrier for a solar panel (10).
A		US 6670541	MORI MASAHIRO et al Consider whole document.

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^W:

F4U

Worldwide search of patent documents classified in the following areas of the IPC⁷:

F24J ; E04D ; H01L

The following online and other databases have been used in the preparation of this search report:

WPI, EPODOC, JAPIO